

Cuttlebones on the Beach at Galveston

BY

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(3 Text figures)

"To him who in the love of nature holds
Communion with her visible forms, she speaks
A various language for his gayer hours
She has a voice of gladness, and a smile
And eloquence of beauty; and she glides
Into his darker musings with a mild
And healing sympathy, that steals away
Their sharpness ere he is awake."

THESE LINES FROM William Cullen Bryant's "Thanatopsis" are particularly appropriate to the pass-time of beach combing, for no matter how barren a beach may be, or how frequently one has combed it, there is always a refreshing release from the cares of the day. Not infrequently, there is something new to excite the imagination, which may speak to each a "various language." One such occasion was experienced by the junior author in January 1968. When combing the beach at 61st Street in Galveston, she came upon a cuttlebone. Shortly she encountered Mrs. Rosalie Schreiber, who had picked up six more and neglected several others. Neither person had ever seen them on the beach before, although both have been ardent beach combers here for many years. Inquiry among devoted beach combers of the Galveston Shell Club revealed only one other cuttlebone. Mrs. Louise Beeman had found one some time previously. Her specimen is larger than the ones found by Mrs. Snider and Mrs. Schreiber, and too worn to be diagnosed much more specifically than to say that it is a cuttlebone.

Where did they come from? Are there cuttlefish (*Sepia*) in the western Atlantic? If they floated here from some distant shore, from which one, and are cuttlebones sufficiently diagnostic to determine the species of cuttlefish? Perhaps they were thrown here by someone who had gotten them elsewhere? Very occasionally marine objects not indigenous to this region are found on the beach at Galveston, probably thrown there by some irresponsible

person. West coast abalone shells, also *Cypraea moneta* and *Melongena corona* have on occasion been found, and doubtlessly came from the shell shops along the sea wall. The local pet shops sell cuttlebones, which pet owners give to caged birds to sharpen their beaks. All that we have seen in the pet shops are almost twice as long as the ones found on the beach in January 1968. They were moreover carefully trimmed with a knife along their lateral margins and ventral surface. That the beach specimens were casually discarded seems unlikely.

The margins of the beach specimens were not trimmed, but the ventral surface was slightly worn. They had no marine growths (barnacles, etc.) on them, and all had a strong odor recalling that peculiar to spoiled squid. This suggests that they did not float in the sea very long.

But *Sepia* is reputedly absent from the western Atlantic, and indeed all shores of the American continents (HOYLE, 1886, p. 223; LANG, 1962, p. 29). Several experienced shrimp fishermen of Galveston to whom we showed a picture of the cuttlefish said that they had never seen it in these waters. We have not found cuttlebones listed in any of the numerous faunal lists of mollusks based chiefly on shore collecting in the western Atlantic. Such lists are not very critical in differentiating between species which actually live in an area, and those which are adventitious, for they frequently list *Spirula*, a shell common on beaches, but known to live only between 200 and 1500 m depth (BRUUN, 1943). In 1968, the senior author found no

cuttlebones in the collection of the U. S. National Museum from beaches along the shores of the Americas, but beach specimens from other shores were well represented.

Along the beaches of England, North Africa, and the Indian Ocean, cuttlebones are said to be common. FORBES & HANLEY (1853, vol. 4, p. 238) noted that "The common cuttlefish (*Sepia officinalis* L.) is one of the most beautiful and curious of British mollusks, but although its bone, or shell, is frequently cast up on all our sandy shores, the creature itself is rarely seen and seldom taken." LANG (1962) noted that tons of cuttlebones are exported yearly from Tunisia, apparently gathered from the beach, although he is not explicit. Of the numerous new species of *Sepia* named since HOYLE (1886) summarized the known Recent Cephalopoda, several have been described from cuttlebones cast upon beaches. Thus, SMITH (1916) described four new species of *Sepia* from beach cuttlebones in South Africa, and WINCKWORTH (1936) one species, based on two cuttlebones found at Madras, India.

There is one recent report of beach cuttlebones in the western Atlantic. ERDMAN (1957) reported finding several at Aneгада, the northeasternmost of the British Virgin Islands. They were found high up on the beach, had been worn by the sea, and "one or two had a greenish tinge in cross section, indicating perhaps some algal growth." One specimen was sent to Dr. Gilbert Voss, who identified it as *Sepia officinalis*. Dr. Voss suggested that it had floated across the Atlantic, and noted that he had several specimens from the east coast of Florida, all of which showed evidence of being at sea for a long time. ERDMAN noted that he had never found cuttlebones in Puerto Rico, where he has spent much time beach combing.

A very early report of *Sepia* in the Caribbean has been discounted by HOYLE (1886) as too vague to be useful. But, as D'ORBIGNY was an astute observer of mollusks, and a specialist in cephalopods, his statement on the matter is worth quoting in full (D'ORBIGNY, 1841, p. 33, translated from the French):

"No. 8. Cuttlefish of the Antilles

"*Sepia antillarum* d'Orb.

We designate, under this purely provisional name, the cuttlefish indicated by Browne [footnote: The natural history of Jamaica, p. 386] as occurring at Jamaica. It is rather common at the other Antilles, and we have before our eyes an example from Martinique preserved in the Museum of Paris, under the improper name of *Sepia Orbigniana* Fer. After having examined it with care, although someone had removed the ossicle from it, it is easy for us to recognize that this is not *Sepia Orbigniana*, but indeed a species one no longer may place near *Sepia vulgaris*, from which by the poor state of preservation and the

absence of the ossicle we are prevented from recognizing the identity or the specific differences.

"However, we do not believe that we should pass in silence this (p. 34) species of the Antilles, but in order to arrive at a better understanding of it, arouse attention in this respect."

We have not seen the rare book by BROWNE (1756) which D'ORBIGNY cites as recording the presence of the cuttlefish in Jamaica. Nor can we account for D'ORBIGNY's comparison of Antillean cuttlefish with *Sepia vulgaris*, for no such trivial name seems to have been used in the genus since 1758. BROWNE seems not to have used the name. Mr. Thomas H. Farr of the Science Museum of the Institute of Jamaica, sent a copy of BROWNE's description, evidently taken from the second edition. BROWNE did not give an illustration of it. The description (BROWNE, 1789 edition, page 386) is as follows:

"SEPIA 1. *Vagina subovato-truncata*.

"THE INK or SCUTTLE-FISH

"This insect is frequent enough about *Jamaica*, but most common on the north side of the island. It is composed of a firm transparent sheath which includes the greatest part of an adherent but softer gelatinous mass, furnished with a great number of *tentaculæ* of different sizes and forms. It is curious to see how readily this creature discharges its ink on the approach of danger, to hide itself in the coloured fluid: but the juices discharged on such occasions, are not only black and thereby sufficient to protect the creature by giving a tincture to and thickening the water about it; they are also bitter and clammy which must probably render them either pernicious to the gills, or hurtful to the eyes of all other fishes."

Mr. Farr also wrote, "We do not know of any specimens of *Sepia* having been found in Jamaica, however cuttlebone has been found at Morant Point at the eastern end of the Island. Mr. Lewis, the Director of the Institute of Jamaica, tells me that his daughter used to collect it there and bring it home for her budgerigars of which she had a considerable number. So cuttle bone does not seem to be rare on Jamaican Beaches."

Dr. Ivan Goodbody of the Zoology Department, University of the West Indies, at Kingston, Jamaica, confirms Mr. Farr's account, writing to us: "I also have collected cuttle bones at Morant Point washed up on the shore, but in spite of doing some extensive Isaacs-Kidd trawling and other fishing off the eastern end of the island none of us have ever collected a living *Sepia*. As the cuttle bones are very buoyant and resilient, they could be carried to Jamaica from a very long way away. I would therefore hesitate to suggest that the cuttle bones which we find come from local animals."

Still, even supposing that cuttlefish do not live in Caribbean waters, it is of interest that the sepions float to Jamaica with some frequency, and have never been found in Puerto Rico.

The case of cuttlebones on New Zealand beaches is noteworthy. SUTTER (1913) listed 3 records of *Sepia apama* GRAY from there, each based on a single sepion from the beach. Almost 50 years later, POWELL (1962, p. 71) noted that cuttlebones and shells of the chambered *Nautilus* occasionally wash ashore on those islands, but he did not think either cuttlefish or nautili lived there. His list (*op. cit.*, p. 126) of species of *Sepia* cuttlebones found in New Zealand has only *S. apama* and *S. plangon*, both known to live in Australia, some 2000 miles westward. COTTON & GODFREY (1940) list 11 species of *Sepia* from South Australia, including those two, and 29 others found elsewhere around the continent. It is strange that cuttlebones of only two of the many species in Australia have floated to New Zealand. Perhaps it is a matter of differences in living habits of the cuttlefish, or intrinsic differences in the cuttlebones, or perhaps it is merely a failure to record the cuttlebones from the shores of New Zealand. ALLEN gives an interesting account of cuttlefish behavior in Australian waters and the cuttlebones on the beaches. She also notes that the sepion of *Amplisepia verreauxi* ROCHEBRUNE, which is a senior synonym of *Sepia apama* GRAY, may reach a length of 45 cm, or 18 inches.

There is one further bit of evidence that *Sepia* does occur in the western Atlantic. OLIVEIRA (1940) named a new subspecies from Brazil, *Sepia officinalis jurajubai*. Her description is too meager to be of much use in differentiating populations of this difficult species complex. In the same year, ADAM (1940) proposed that several nominal species of larger cuttlefish of the eastern Atlantic are merely subspecies of *S. officinalis*, and these can be in part distinguished by their cuttlebones. OLIVEIRA did not describe or illustrate the cuttlebone of the specimen she examined, but from her photographs it is evident that she had a whole animal and that it is similar to *S. officinalis*.

Could it be that OLIVEIRA's specimen had migrated across the Atlantic? If *Sepia* lives in the western Atlantic, why is its presence so rarely reported? Perhaps it does live here, but in situations which are little frequented by fishermen using suitable gear to catch them. ABEL (1916) made a study of the habits and behavior of living cephalopods for a better understanding of fossil species, but he merely notes of *Sepia* that it lives near the bottom, over sand. ABEL, ADAM, and other writers say that *S. officinalis* is migratory, spending most of the year in deeper water,

but coming to shore during the breeding season, in the warmer months. TRYON's (1883, vol. 2, p. 40) account is worth quoting:

"According to Verany, this animal (*S. officinalis*) prefers rocky localities in the Mediterranean, where it is fished by means of a dredge called a balancelle, and is also taken at night with the trident. During the month of March the fishermen use a living female Cuttle fastened to a rope, or an imitation of one formed of wood, and made attractive to the male sex by being ornamented with bits of glass; this latter enveiglement is called by the Sicilians a fumedda, and fishing with either of them is very productive and amusing, especially on a moonlight night . . . Their flesh is esteemed and abounds in the Italian markets at all seasons of the year."

LANG (1962, pp. 169ff) describes a fishing method of baited traps used in the Mediterranean. These are made of wicker baskets, attached along a weighted line. He also repeats the account of fishing with female cuttlefish and artificial lures.

From the above descriptions, we may suppose that if *Sepia* lives near Galveston, it is likely to be around the rocky reefs that occur beyond the 10-fathom zone, some 30 miles offshore. Those areas are not attractive to fishermen using shrimp trawls, because of the danger of

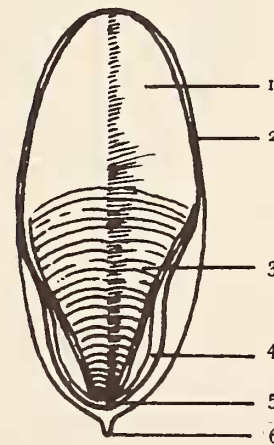


Figure 1

Ventral view of the shell of *Sepia mestus* GRAY.
After HOYLE, (1886, p. 123)

- 1 - Last loculus - 2 - Chitinous margin of outer cone
3 - Striated area (margins of earlier loculi) - 4 - Limb of inner cone
5 - Inner cone (a thin file of calcareous matter) - 6 - Spine



Figure 2

Ventral view of a cuttle bone found at Galveston. 70 mm long



Figure 3

Dorsal view of same cuttlebone shown in Figure 2

tearing the nets. If the population of *Sepia* were small, the individuals alert but shy, they might not be easily taken.

The cuttlebones of Galveston (Figures 2 and 3) seem to be all of one species; there is nothing very different from the specimens of *Sepia officinalis* ossicles sold in the pet shops, nor from descriptions and illustrations of that species in the literature. Figure 1 indicates the terms applied to parts of a cuttlebone. Figures 2 and 3 were drawn by the junior author from the beach specimens of Galveston.

The outline is elongate oval, with the sides almost parallel throughout most of their length, and slightly sinuate about a fourth of the length from the hind end. The locular margins were too worn to note the pattern of their edges or the locular index (length of last loculus as percent of total length). The dorsal surface is covered by a thin sheet of shiny, transparent cuticle over its hind end, and the rest is uniformly, faintly roughened by short, transverse, closely spaced rugae. There is a shallow furrow, poorly defined, on each side of the midline, with a low medial ridge between them. In side view, the cuttlebone

is almost flat. The spine is short and acute. The chevron markings on the ventral surface of the one drawn seem to be the bill print of some shore bird.

Measurements (in millimeters)	
Length	Width
70	22 (Figures 2, 3)
82	26
88	30
75	25
75	26

That there is much yet to be discovered concerning the mollusks, and particularly the cephalopods, of the Gulf of Mexico can scarcely be denied. We may further note that Voss (1956), in monographing the cephalopods of the Gulf, merely suspected the presence of *Argonauta* here, and had no specimens from the area. Several specimens with animal and shell were found in the stomach of the dolphin, *Coryphaena*, in the summer of 1966 by Mr. Jim Dailey, while fishing south of Freeport, Texas. To our knowledge, *Argonauta* has never been found alive in this area. Beach shells are much rarer than the literature indicates. At least, we have never found any in Louisiana or Texas. But *Coryphaena* knows where the paper nautilus lives, and how to capture it. WARMKE (1961) also reports the paper nautilus from a fish's stomach in Puerto Rico.

Interesting in this respect is the case of the giant squids of the family Architeuthidae, monsters of 4 m body length and more. These are known only from disabled specimens floating on the surface, or cast ashore, or disgorged by captured whales. LANG (1962) has a vivid account of battles between these squid and whales, noting that the squid may be the protagonist (see also VERRILL, 1882). Although giant squid are said to be cosmopolitan, the dearth of records of juveniles captured by trawling is striking, particularly if they are, as noted by Voss (1956, p. 138): "in all probability very poor or weak swimmers and not at all adapted for catching active prey. Indeed, they should fall easy victims to the sperm whale, their natural enemy."

ADDENDUM

After this paper was written, Mr. William Wardle found two cuttlebones on the east end of Galveston Island, on 21 December 1968. These are about equal in size, but they are larger than the ones found nearly a year before. The larger one is 135 mm long, 43 mm wide, and 19 mm

thick. They are of the same species as those found earlier, and in even more perfect condition. There is no evidence of epibiota on them. A break in the inner cone of one shows a transparent material resembling cartilage filling its interior. The lower surface of both specimens was badly scarred and pitted by chevron markings, again suggesting these had been pecked by sea birds. The lower surface is thickest about one-fourth the length from the hind end, from which point it slopes forward in a gentle convex arch, and backward in a more pronouncedly concave excavation. The striated area begins at the thickest point of the sepion, and thus the locular index is about 75% of the length.

Besides being larger, the Wardle specimens show two important anatomical differences from the smaller ones: (1) The dorsal surface has a thin, smooth cuticle along the posterior half of each margin, leaving a broad V-shaped area in the middle free of it. The apex of the V is nearly at the hind tip of the shell. Contrast the shallow V of the smaller specimen drawn in Figure 3, in which the dorsal cuticle is limited to the hind fourth of the shell.

(2) There is no projecting spine, and the chitinous margin of the outer cone seems to extend a little farther behind the calcareous part of the shell than in the smaller specimens. These differences probably represent changes during growth, rather than distinct species.

The sculpture of the dorsal area is of small bosses and short vermiculate rugae, rather irregularly oriented and closely spaced. The Wardle specimens were dropped into alcohol when found. This method of preservation allows details to be seen much more clearly than in the smaller specimens, which were dried.

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